

# The Value of Opinion in Science and the Forest Service Research Organization

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**ABSTRACT** There is confusion about conflicts of interest between sources of funding and the extent to which Forest Service researchers are free to publish their findings. Forest Service Research is an independent entity with no administrative accountability to policy makers up to the office of the Chief of the Forest Service. Congressional mandate ensures that research will be free from the influence of politics that land management necessarily entails. Because politics involves opinions, it is important to note that opinions per se are not scientific and must be appropriately compared with empirical data before they can be considered so. It is the quantitative test of an opinion that renders it scientific, not the opinion itself. (JOURNAL OF WILDLIFE MANAGEMENT 73(5):811–813; 2009)

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In the United States, public lands support the greatest wildlife diversity, including that of threatened and endangered species. Public lands include about 80 million ha that fall under the jurisdiction of the National Forest System, the management branch of the United States Forest Service. Lands of the National Forest System are the scene of many land-management controversies (due in part to their biotic richness), including misperceptions about whether United States Department of Agriculture-funded researchers are spokespersons for their Agency's mission, for special interests groups that often fund Agency research, or simply for independent science. Hence, it was my aim to offer a brief explanation of how the Forest Service is organized and from whence the main branches draw their authority, and to discuss how opinion influences scientific thought and land-management policy. In this context, I will address concerns expressed by Alpert and Keller (2003) regarding the endosymbiotic role of Forest Service research scientists, and I will discuss the role of opinion in science. In these discussions, I will address science in general and relative to decision-making within the Forest Service and other land management agencies.

## FOREST SERVICE RESEARCH

The Forest Service is comprised of 3 major branches: the National Forest System (managers and policy makers for National Forests and National Grasslands), Research and Development (research scientists chartered to address issues in natural resource management for numerous information users, including the public), and State and Private Forestry (responsible for providing assistance to private and state landowners). My thoughts are most relevant to the first 2 branches.

Administratively, the National Forest System and the Research branches are distinct until one gets to the office of the Chief of the Forest Service, meaning that these 2 branches are administratively distinct until joined at the very

top of the organization. There is good reason for this, as I will explain.

The McSweeney–McNary Forest Research Act of 1928 (replaced by the Forest and Rangeland Renewable Resources Research Act of 1978 [16 United States Code 1600(note); U.S. Forest Service 1978]) is the statute that enabled the Forest Service to conduct scientific research for a wide range of information users. The Forest Service Manual (FSM), which provides direction on how to implement statutes and related regulations, states in the section on Research Policies, "To achieve its Research and Development (R&D) program objectives, the Forest Service shall . . . maintain the R&D function as a separate entity . . . with clear accountability through a system that maintains scientific freedom. . . ." (U.S. Forest Service 2005:2). This means that both Congress and the authors of these FSM directives recognized the importance of keeping research independent. This also signifies congressional intent to protect a key element of scientific credibility (L. Ruggiero, Forest Service Research, unpublished data).

In addition to this statutory and regulatory direction, Congress appropriates funds separately for management and for research within the Forest Service. Appropriation boundaries result and Congress insists that research scientists and managers maintain distinct roles. This distinction is formalized by appropriating funds separately, thus ensuring that funds appropriated for one purpose are not used for the other with few exceptions.

Importantly, separation of these 2 branches ensures that science is kept separate from policy and, thus, research scientists are insulated from the political ramifications of the policy-forming process. The wisdom here is that science cannot be credible if it is politicized, and this logic keeps scientific research independent while ensuring that policy makers are free to consider factors other than scientific understandings.

Thus, science informs land-management decisions while decision-makers are held accountable for the quality of their decisions via other means. However, this discussion does not

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imply that Congressional intent is always followed, and occasionally the roles and responsibilities of the National Forest System and Forest Service Research become confounded. One example of this is when managers ask research scientists for their opinions when better information is obtainable.

## VALUE OF OPINION

Political will for a sustained commitment to research is often absent in wildlife ecology and related land-management decisions. This is especially true when conservation issues exist; thus, failure to make a sustained commitment to research occurs regularly. There may be multiple reasons for such a situation, but I believe that foremost among these is the perception that such information will constrain extant land-management programs (Thomas 1985; B. Powell, National Forest System, personal communication). As a result, some decisions about specific management actions or about public policy are inappropriately based on opinion without formal consideration of relevant science. Although this approach is sometimes appropriate (e.g., recovery team assignments or Presidential mandates), such an approach is usually inappropriate for the following reasons.

Credible scientific information is not based solely on one's opinion. Opinion is not reproducible, and the value (reliability) of opinion is often unknown. This is especially true in the absence of a strong empirical basis and in the absence of appropriate tests of such opinions. Moreover, we know that it is a human propensity to hold strong opinions that later investigations find to be false (Ruggiero and McKelvey 2000). This means that opinion-based methods, or Delphi methods as they have become known (Ziglio 1996), are not meaningful surrogates for a commitment to the accumulation of knowledge through the application of scientific methods. Indeed, decisions based on opinion may be expedient, but they can be antithetical to science and sound management. However, opinions are an integral part of the scientific process because from subjective opinion comes creativity and ideas of mind that become testable hypotheses (Mills 2007).

In the above sense, opinions are an essential but potentially biased part of the scientific process. Biased opinions can lead to biased questions (hypotheses), and such opinions can in turn lead to incorrect or misleading experimental outcomes. For example, asking if a particular drug is effective without disclosing the number of people who must be treated (no. needed to treat) to help one individual can be misleading and potentially biased towards either making money or helping individuals (Carey 2008). As a further example, management actions can be antithetical to their stated purpose when deciding which forest management alternatives are best for certain species when opinion is used in lieu of scientific understandings about the ecology of the species throughout its range.

Although opinions are part of most human endeavors because they are integral to our thoughts, science has developed a set of rules whereby bias is minimized

(Romesburg 1981, Krebs 1989). Such rules often vary by discipline and depend on the state of the art, meaning that they vary with knowledge and become more sophisticated as empirical information and technological where-with-all accumulates. In all cases, however, one's interpretation of opinions becomes highly disciplined by scientific methods and procedures, and interpretations are limited to defensible inferences based on empirical data. In this way, reliable knowledge accumulates and insights that have scientific merit are judged as such by the anonymous peer-review process used by scientific journals. Thus, anonymous peer review as well as the strength and specificity of the relationship between ideas, data, and inference distinguish scientific insights from opinion.

## CONCLUSIONS

The Forest Service is not a monolithic organization. Research scientists with the R&D branch of the organization are, for the most part, independent of the politics that land management necessarily entails. Moreover, enabling legislation established by Congress ensures this independence partially to ensure scientific credibility (L. Ruggiero, unpublished data). Such independence and a lack of administrative accountability hold until one reaches the office of the Chief of the Forest Service, where political influences can possibly affect science.

Because politics involves opinions, it is important to emphasize that opinions per se are not scientific and must be appropriately compared with empirical data before they can be considered so. It is the quantitative test of an opinion that results in scientific information, not the opinion itself. Thus, opinion-based methods are inappropriate surrogates for a sustained commitment to scientific research when land management policy will be established or when relevant decision-making is likely.

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